

What is claimed is:

1. A method of treating animal manure solids comprising contacting the solids with an effective treatment amount of a treatment composition comprising $\text{AlCl}_3 \cdot n\text{H}_2\text{O}$ or $\text{Al}(\text{NO}_3)_3 \cdot m\text{H}_2\text{O}$, or the residue of $\text{AlCl}_3 \cdot n\text{H}_2\text{O}$ or $\text{Al}(\text{NO}_3)_3 \cdot m\text{H}_2\text{O}$, to form a treated waste product having an improved environmental, health and/or animal performance property, wherein n is from 0 to 10, and m is from 0 to 12.
2. The method of claim 1 wherein the treatment amount is effective to reduce phosphorus solubility in the manure.
3. The method of claim 1 wherein the treatment amount is effective to reduce phosphorus runoff and/or phosphorus leaching from fields fertilized with manure.
4. The method of claim 1 wherein the treatment amount is effective to inhibit ammonia volatilization from the manure.
5. The method of claim 1 wherein the treatment amount is effective to improve weight gains, feed conversion, and/or disease resistance of animals.
6. The method of claim 1 wherein the treatment amount is effective to flocculate solids in the manure.
7. The method of claim 1 wherein the treatment amount is effective to reduce pathogens in the manure.
8. The method of claim 1 wherein the treatment amount is effective to increase the nitrogen content of the manure.
9. The method of claim 1 wherein the treatment amount is effective to reduce acid rain, atmospheric nitrogen loading and PM-10s associated with the manure.
10. The method of claim 1 wherein the treatment amount is effective to reduce energy use in an animal rearing facility.
11. The method of claim 1 wherein the manure is from poultry.
12. The method of claim 1 wherein the treated waste product comprises from about 0.001 to about 50 parts by weight of $\text{AlCl}_3 \cdot n\text{H}_2\text{O}$ or $\text{Al}(\text{NO}_3)_3 \cdot m\text{H}_2\text{O}$, or the residue thereof, and about 50 to about 99.999 parts by weight animal manure solids.

13. The method of claim 1 wherein the treated waste product comprises from about 0.1 to about 20 parts by weight of $\text{AlCl}_3 \cdot n\text{H}_2\text{O}$ or $\text{Al}(\text{NO}_3)_3 \cdot m\text{H}_2\text{O}$, or the residue thereof, and about 99.9 to about 80 parts by weight animal manure solids.
14. The method of claim 1 wherein the treatment composition comprises $\text{AlCl}_3 \cdot n\text{H}_2\text{O}$ or the residue of $\text{AlCl}_3 \cdot n\text{H}_2\text{O}$, and n is from about 4 to about 8.
15. The method of claim 1 wherein the treatment composition comprises $\text{Al}(\text{NO}_3)_3 \cdot m\text{H}_2\text{O}$ or the residue of $\text{Al}(\text{NO}_3)_3 \cdot m\text{H}_2\text{O}$, and m is from about 7 to about 11.
16. The method of Claim 1 wherein the treatment composition comprises aluminum chloride hexahydrate, or the residue thereof.
17. The method of Claim 1 wherein the treatment composition comprises aluminum nitrate nonahydrate, or the residue thereof.
18. The method of claim 1 wherein the treatment composition comprises a liquid including from about 0.05 to about 500 grams of solution residue of $\text{AlCl}_3 \cdot n\text{H}_2\text{O}$ or $\text{Al}(\text{NO}_3)_3 \cdot m\text{H}_2\text{O}$ per liter of liquid.
19. The method of Claim 1 wherein the treatment composition comprises a liquid including from about 0.5 to about 100 grams of the solution residue of $\text{AlCl}_3 \cdot n\text{H}_2\text{O}$ or $\text{Al}(\text{NO}_3)_3 \cdot m\text{H}_2\text{O}$ per liter of liquid.
20. The method of Claim 1 wherein the treated waste product has a pH of about 7.5 or below.
21. The method of Claim 1 wherein the treated waste product has a pH of about 6.5 or below.
22. The method of Claim 1 wherein the level of soluble phosphorus in the treated waste product is less than the level of soluble phosphorus in the animal manure solids.
23. The method of claim 1 whereby $\text{AlCl}_3 \cdot n\text{H}_2\text{O}$ or $\text{Al}(\text{NO}_3)_3 \cdot m\text{H}_2\text{O}$, is added in sufficient quantities to provide a layer of foam.
24. The method of claim 25 whereby the depth of the foam that forms will be from 0.001 to 50 cm.

